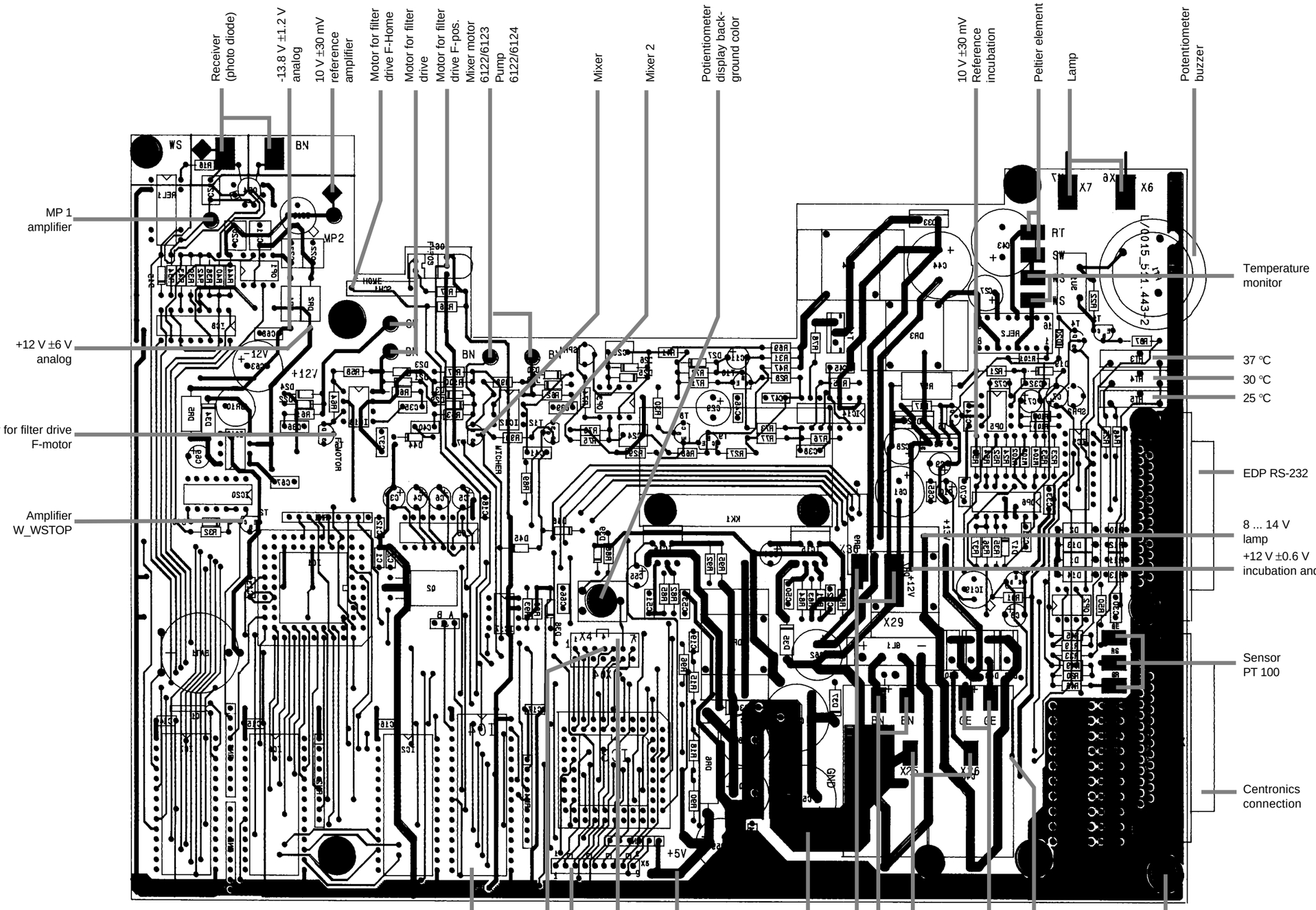
ECOM 6122–25

Service Manual

English

eppendorf



Note: Measure all DC voltages against GND.
Before measuring on the PCB Peltier element, short-circuit red and black (the entire base plate is heat sink).

Measure lamp at plugs X6 und X7.

Measuring points PCB Control solder side

eppendorf

3 Error lists / Troubleshooting

Measured value display

6 places are available for the display of the test result and its sign.

The test result is checked at the beginning, during and at the end of measurement.

If an error occurs, the error flag is shown in the display. Max. 4 flags can be displayed in addition to the test result.

Flags P and R are displayed in the same place. If both flags are relevant, flag K is displayed in the relevant place.

The result is compared with the dilution limit after all factors have been taken into consideration. If the result exceeds the dilution limit, it is not displayed.

The reaction direction is observed separately for the sample values and the blanks. The reaction direction of end-points is not checked.

No more than 3 decimal places can be displayed for the result. The normal range and the dilution limit are checked last of all.

Flag	*Description*
I	Incubation time exceeded.
K	P and R flag together.
P	Photometer no longer in the linear measuring range.
R	Wrong reaction direction.
T	Temperature error.
V	Predilution (in front of the result).
+/–	Normal range left. Results < > than entered normal values.

3 Error lists / Troubleshooting

Error number	*Error text*	*Cause*	*Solution*
00 up to 28	System error	System error. Electromagnetic disturbance?	Switch device off/on. Check main power voltage. Exchange PCB.
120	Wrong parameter value	"0" entered for parameter: • 4 R1 volume. • 5 Sample volume. • 18 No. of standards. • 25 N standard. • 26 Adjustment factor. "-" entered for parameter: • 26 Adjustment factor. • 28 Dilution limit. • 29,30 Normal values.	Enter valid values: • R1 = 1–9999 µl. • P1 = 1– 999 µl. • 1–6 with calibration "On". • 1–2 permitted. • 0,0001–999999. Only positive values permitted: • 0,0001–999999.
121	Parameter too long	Memory defective.	Switch device off/on. Exchange PCB.
122	Parameter too short	Memory defective.	Switch device off/on. Exchange PCB.
123	Wrong parameter	"--" entered for parameter: • 2 EDP no. • 4 R1 volume. • 5 Sample volume. • 6 R2 volume. • 7 R3 volume. • 13 Measuring time. • 19–24 Std. x concentration. • 25 N standard. • 26 Adjustment factor. • 27 Adjustment constant. • 28 Dilution limit. •29+30 Normal values.	Enter valid values: • Max. 3 digits. • R1 = 1–9999 µl. • P1 = 1– 999 µl. • 0–999 µl. • 0–999 µl, if no R2 volume is needed, "0" is entered. • Min. 00:12, max. 99:59 eingeben. • Enter concentrations. • 1–2 permitted. • 0.0001–999999.

Error number	Error text	Cause	Solution
124	End-point: no blank	For end-point measuring procedure, "None" is selected for parameter 9, Cuvette blank, the User function 01, Cuvette blank, is switched off.	End-point measuring procedure requires a blank (RB, SB, CB); Switch on cuvette blank or select a blank.
127	Start kinetics Inc. 1 < 30	Parameter 12, Incubation time 1, is too short to measure a start kinetic (with R1 and S).	Enter at least 30 s for incubation time 1.
128	Start kinetics Inc. 2 < 30	Parameter 11, Incubation time 2, is too short to measure a start kinetic (with R1, S and R2).	Enter at least 30 s for incubation time 2.
129	Start kinetics Inc. 3 < 30	Parameters 12, Incubation time 3, is too short to measure a start kinetic (with R1, S, R2 and R3).	Enter at least 30 s for incubation time 3.
162	Inc. time no ENT	Incubation time has elapsed before the cuvette was moved from the mixing to the measuring position and "ENT" pressed; sample can no longer be measured.	Prepare sample again.
163	Std. mean too large	Results of the standard samples deviate by more than ±5 % from each other.	Check quality and shelf life of the standard and of reagents. Remeasure standards.

Error number	Error text	Cause	Solution
164	No valid standard	Standard result with error "++++++" or standard results are deleted.	Check quality and shelf life of the standard and of reagents. Remeasure standards.
200	Filter rot. home timeout	• Mechanical sluggishness. • Motor defective. • Light barrier defective. • Control defective.	• Check mechanics. • Exchange motor. • Exchange light barrier. • Exchange PCB.
201	Filter not in home pos.	• Switch "SCH1" defective. • Low signal "F-home" is not further processed. • Magnet is missing or defective. • Control defective. • Motor defective.	• Exchange switch. • Exchange IC 3 or PCB. • Insert/Exchange magnet. • Exchange PCB. • Exchange motor.
240	Cal. report not poss.	Attempt to print a calibration report from a method: - with factor without RB, - which has no calibration values.	Calibration report can only be printed, if there is a valid calibration or a valid reagent blank.
280	Converter INT constant	Device error.	Switch device off/on. Check signal interrupt. Exchange PCB.
281	Converter timeout	Device error.	Switch device off/on. Check signal interrupt. Exchange PCB.

Error number	Error text	Cause	Solution
282	Converter thres. inval.	Device error.	Switch device off/on. Check signal interrupt. Exchange PCB.
301 up to 303	EDP rec. framing	• Disturbance on the data line. • EDP system not ready/incorrectly set. • EDP parameters incorrectly initialized. • PCB defective.	• Check data line. • Check EDP system. • Check EDP parameters. • Exchange PCB.
304, 306	EDP rec. overrun	• Line to EDP disturbed. • Disturbance on the data line. • EDP system not ready/ incorrectly set. • EDP parameters incorrectly initialized. • PCB defective.	• Check line. • Check data line. • Check/Switch on EDP system. • Check EDP parameters. • Exchange PCB.
305, 307	EDV Receiver framing		
308	EDP rec. block too long		
309	EDP rec. block unknown		
311	EDP tra. timeout CTS?		
312	EDP tra. too many NAKs		
313	EDP tra. timeout ACK/ NAK		

3 Error lists / Troubleshooting

Error number	*Error text*	*Cause*	*Solution*
314	EDP tra. timeout resp.?	During method transfer ECOM ➡ ECOM, receiver does not respond.	• Transmission cable defective/incorrect. ECOM receiver defective. • Connector cable in printer socket. • PCB defective. • Check device for uniform EDP parameters.
991 to 996	Fortran runtime Error	Memory disturbance.	Switch device off/on. Exchange PCB.
999	Invalid error no.	Electromagnetic disturbance?	Switch device off/on. Check main power voltage. Exchange PCB
Other errors:			
- - -	Mixer starts only briefly	J1 is put on place B (B ➡ test computer).	Place J1 onto A (J1 ➡ routine).
- - -	Mixer makes noise/ does not mix	Mixer motor has slid down because of bad fastening.	Adjust mixer again.
- - -	Mixer rotates in one direction only	• Housing adjusted incorrectly. • Controlling IC defective.	• Adjust again with cuvette insert. • Replace PCB. Replace IC.

Error number	Error text	Cause	Solution
	++++++	Absorbance is larger than the measuring range of the photometer: • Sample too turbid. • Contamination in beam path, too little light falls on the receiver. • Lamp defective.	 • Dilute sample, measure again. • Check cuvette holder. Replace lamp, where appropriate. • Replace lamp.
	!!!!!!	Result cannot be displayed (value 100,000), factors too large.	Check parameters (17 Factor, 19 to 24 Standard), recalibrate.
	Not linear	Only appears with kinetic and kinetic + start measuring procedures. If the error occurs with SB, do not continue until a linear value has been reached. • Sample too turbid. • Sample is highly active, lies above the dilution limit. • Sample or reagents contaminated.	 • Dilute sample. • Dilute sample. • Check whether the sample or reagent contains particles, air bubbles or foam. If the error occurs frequently for one method, check the shelf life of the reagents.
	Start kin.	The sample result is below the dilution limit, however, the start kinetics is above the dilution limit.	Dilute sample and remeasure.

Error number	Error text	Cause	Solution
	> Dil.limit	Result is larger than the dilution limit.	Dilute sample and remeasure.
	+/–	Normal value overshot/undershot.	Dilute sample and remeasure.
	–	Negative result: • Incorrect reaction direction entered. • Adjustment constant is negative. • Samples measured after calibration with another wavelength. • Zero adjustment missing.	• Change parameter 14. • Change parameter 27. • Do not modify method parameters during processing. • Carry out function "03" Zero adjustment. Do the same with the method to be measured.
	I	The cuvette to be measured was not moved to the measuring position until the incubation time was over. During kinetic + start measurement: measurement of start kinetics not possible because the sample was not moved to the measuring position immediately after mixing and "ENT" was not pressed.	Prepare sample again. Move cuvette in time and press "ENT" during the incubation time. Sample result is measured. To evaluate start kinetics, remeasure sample.
	K	Error P and R occurred together.	See P and R.

Error number	Error text	Cause	Solution
	P	Specific range of photometer overshot (depending on the wavelength): • Sample is turbid. • Contamination in beam path, too little light falls on the receive.	• Dilute sample or prepare again. • Check cuvette holder for contamination. Exchange halogen lamp, where appropriate.
	R	• Reaction direction within a measurement different than entered. Does not appear for end-point measuring procedure. • Old/Wrong reagent.	• Check whether sample contains particles, air bubbles or foam. Dilute samples, where appropriate. • Check quality and shelf life of reagents. Observe manufacturers' recommendations.
	T	Temperature during measurement above/below nominal value. The sample is flagged even if the error only occurred during SB measurement	Wait until the display "XX deg." no longer flashes, measure again.
	V	Appears in front of the result. Denotes diluted samples for which a dilution was entered. The result is already multiplied by the dilution factor (no recalculation).	

Error number	Error text	Cause	Solution
	Inaccuracy of a method	• Correct parameters programmed?	• Check parameters for volumes, times, blanks, factors.
		• Correct standard solution used?	• Standard solution must correspond with the standard concentration.
		• Standard too old, contaminated?	• Use new standard.
		• Reagent correctly prepared?	• Prepare reagent according to regulations. Use new reagent, where appropriate. Use clean pipettes and cups.
		• Correctly pipetted?	• See Sec. 4.2.4 of the ECOM Operating Manual and manual of the pipette.
		• Absorbance of reagent stable?	• Repeat RB within the series more often (call new method).
		• Cuvettes clean?	• Rinse cuvettes correctly. Rinse out cleaner and dry. Rinse suction cuvettes sufficiently. Avoid finger-prints on optical surfaces.
		• Incubation okay?	• Preheat reagent sufficiently. Set correct temperature (activity too high = temperature too high, activity too low = temperature too low). • Check/Exchange Peltier element. • Check/Exchange temperature monitor. • Check/Exchange temperature sensor. • Adjust incubation, see Sec. 4/5. • Exchange PCB Control.

Error number	Error text	Cause	Solution
	Imprecision of a method, abnormal result.	• Reagent shelf life overshot?	• Check date on packaging. Use new reagent, where appropriate.
		• Reagent prepared according to recommendations?	• Prepare new reagent. Check water quality.
		• Correctly pipetted?	• See Sec. 4.2.4 of the ECOM Operating Manual and manual of pipette.
		• Pipette okay?	• If not, exchange.
		• Correct incubation?	• Heat reagent sufficiently.
		• Correct incubation time?	• If not, change parameters.
		• Cuvettes clean?	• Rinse cuvettes correctly. Rinse out cleaner and dry. Rinse suction cuvettes sufficiently. Avoid finger-prints on optical surfaces.
		• Samples clear, without suspended particles?	• Centrifuge samples.
		• Photometer drift.	• Halogen lamp is old, install new one.
	No display, halogen lamp does not burn.	• Is device connected to main power supply, main power plug loose?	• Check connection.
		• Fuse blown?	• Exchange fuse. Check plug connection "Display" on the PCB Control, plug X4.
			• Check +5 V at plug X4, Pin 6 and 7.

Error number	Error text	Cause	Solution
	No display, halogen lamp burns.	• Display defective. • Great fluctuations in measured values, other consumer in same fuse circuit?	• Exchange fuse. • Check plug connection "Display" on the PCB Control, plug X4. • Check +5 V at plug X4, Pin 6 and 7. • Observe fluctuations in measured values without cuvette. Connect device in separate fuse circuit.
		• Lamp defective.	• Install new lamp.

4 Disassembly / Assembly

Exchanging the PCB control

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually. Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
If the device should be switched on when the base plate is dismounted, the connections of the Peltier element on the PCB have to be short-circuited!

– Disconnect lamp from the PCB Control.

☞ ***Before unsoldering the receiver you must short-circuit the amplifier inputs X17 and X19 with a jumper!***
The input is very sensitive (static charge).

– Unsolder all other cable connections.

– Unscrew the 4 stay bolts of the PCB.

– Unscrew Phillips screw of the ground connection PCB ➡ housing.

– Remove PCB from the housing.

– Disconnect plug of display and keypad.

Install in reverse order.

☞ ***Screw on base plate, see "Mounting the base plate"!***

– Start up device.

– Check incubation, see "Adjusting the incubation".

4 Disassembly / Assembly

Exchanging the Peltier element

Aids:	Heat-conducting paste (mixture)	6122 044.007
	Torque screwdriver	Range 1.8 Nm
	Spatula	

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually. Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure, short-circuit the connections of the Peltier element!

– Unsolder connections of the Peltier element from the PCB Control and from the incubation block.

☞ ***Clean all surfaces which come in contact with the Peltier element including the surfaces of the Peltier element itself carefully before mounting!***

The surfaces must be dry and absolutely clean!
The surfaces must not be scratched or uneven!

Scratches, lint or dust particles between the base plate - Peltier element and Peltier element - incubation block lead to poor heat transfer and in turn poor or malfunctioning incubation.

– Apply the diluted heat-conducting paste with a spatula evenly (yet thinly) to both surfaces of the Peltier element. The heat-conducting paste must only bubble slightly.

– Place Peltier element onto the incubation block.

– Solder connections of the Peltier element on the PCB Control.

☞ ***Screw on base plate, see "Mounting the base plate".***

– Start up device.

– Check incubation, see "Adjusting the incubation".

Exchanging/Adjusting the mixer motor 6122/6123

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually.
Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure on the PCB, short-circuit the connections of the Peltier element!

– Unscrew ground connection of incubation block.

– Remove incubation block from housing. (Fits loosely on stay bolts.)

– Loosen lateral clamping screw of the motor mounting.

– Push out mixer motor upward.

– Install new mixer motor.

☞ ***See "Adjusting the mixer motor"!***

Install in reverse order.

☞ ***Screw on base plate, see "Mounting the base plate"!***

– Start up device.

4 Disassembly / Assembly

Exchanging the filter rotor

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually.
Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure on the PCB, short-circuit the connections of the Peltier element!

– Disconnect lamp from the PCB Control.

– Unscrew the 4 stay bolts of the PCB.

– Unscrew Phillips screw of the ground connection PCB ➡ housing.

– Shift PCB to side.

– Unscrew the two screws of the filter rotor block.

Install in reverse order.

– Wheel of the filter rotor must interlock cleanly and with little clearance into the position of the Maltese.

☞ ***Screw on base plate, see "Mounting the base plat"!***

– Start up device.

– Start up the filter rotor with the service function.

– The filter rotor must run perfectly.

☞ ***Maximum current consumption fo the filter rotor ➡ 80 mA!***

Exchanging the receiver

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually. Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure on the PCB, short-circuit the connections of the Peltier element!

– Disconnect lamp from the PCB Control.

☞ ***Before unsoldering the receiver you must short-circuit the amplifier inputs X17 and X19 with a jumper!***
The input is very sensitive (static charge).

– Unsolder all other cable connections.

– Unscrew the 4 stay bolts of the PCB.

– Unscrew Phillips screw of the ground connection PCB ➡ housing.

– Take PCB out of the housing.

– Disconnect plugs of display and keypad.

– Unscrew ground connection of incubation block.

– Remove incubation block.

– Unscrew 4 Phillips screws and the 2 guide pins of the panel next to the filter rotor.

– Exchange receiver.

☞ ***Place connection wires of the receiver into the groove, do not squeeze!***

Install in reverse order.

☞ ***Screw on base plate, see "Mounting the base plate"!***

– Start up device.

– Check incubation, see "Adjusting the incubation".

4 Disassembly / Assembly

Exchanging the fan

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually.
Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure on the PCB, short-circuit the connections of the Peltier element!

– Disconnect lamp from the PCB Control.

– Remove lamp.

– Unsolder all cable connections.

– Unscrew the 4 stay bolts of the PCB.

– Unscrew Phillips screw of the ground connection PCB ➡ housing.

– Take PCB out of the housing.

– Disconnect plugs of display and keypad.

– Unscrew ground connection of incubation block.

– Remove incubation block.

– Unscrew 2 Phillips screws and the 2 guide pins of the panel next to the filter rotor.

– Exchange complete assembly of fan.

Install in reverse order.

☞ ***Screw on base plate, see "Mounting the base plate"!***

– Start up device.

– Check incubation, see "Adjusting the incubation".

Exchanging the temperature sensor 6122/6123/6124

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually. Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure on the PCB, short-circuit the connections of the Peltier element!

– Remove Peltier element and place aside.

– Unsolder temperature sensor.

– Unscrew copper angle.

– Unscew the second fastening screw of the incubation block.

– Remove incubation block.

– Push holder out of the incubation block.

– Exchange temperature sensor.

Install in reverse order.

☞ ***Screw on base plate, see "Mounting the base plate"!***

– Start up device.

– Check incubation, see "Adjusting the incubation".

4 Disassembly / Assembly

Exchanging the temperature monitor 6122/6123/6124

– Switch off device.

– Disconnect main power plug.

– Loosen (only 1/8 of a revolution) and remove the screws of the Peltier element (3 screws) gradually.
Do not remove screws individually, danger of Peltier element breaking.

– Remove screws of base plate (4 screws).

– Dismount base plate.

☞ ***Do not start up device when base plate is dismounted!***

The base plate is also the cooling plate for the Peltier element.
To measure on the PCB, short-circuit the connections of the Peltier element!

– Remove Peltier element and place aside.

– Unsolder temperature monitor.

– Unscrew copper angle.

– Unscrew the second fastening screw of the incubation block.

– Remove incubation block.

– Push holder out of the incubation block.

– Remove 2 Phillips screws of the cover of the temperature insert.

– Remove cover.

– Exchange temperature monitor.

Install in reverse order.

☞ ***Screw on base plate, see "Mounting the base plate"!***

– Start up device.

– Check incubation, see "Adjusting the incubation".

Exchanging the lamp

⚠ ***Lamps which are not approved by Eppendorf must not be used!***

– Switch off device.

– ***Up to device no. 89:***
Remove screws of the cover in the panel over the lamp.

– ***From device no. 90:***
Loosen screws of the cover in the panel over the lamp.

– Remove cover.

– Exchange lamp, see imprint on packaging.

Install in reverse order.

☞ ***Do not touch glass cylinder of the lamp with bare fingers!***

☞ ***Adjustment is not required!***

– Start up device.

– Zero adjustment.

– Execute service function "Lamp test.

Replacing of pump motor in ECOM 6124

– Switch off device.

– Disconnect main power plug.

– Remove cover above pump.

– Remove fastening screw of the cuvette.

– Tke out pump tube.

– Take out cuvette.

☞ ***Do not touch glass part of the cuvette with your fingers!***

– Loosen screws for Peltier element (3 pcs.) gradually (screw by crew, each time only 1/8 revolution) and remove screws.
Do not loosen a single screw completely. This may damage of the Peltier element.

– Remove screws from base plate (4 pcs).

– Remove base plate.

☞ ***Do not put device into operation when base plate removed!***

The base plate is simultaneously used as a heat sink for the Peltier element.
When measuring on the PCB, the Peltier element connections should be short-circuited!

– Unscrew ground connection of temperature control block.

– Take temperature control block out of the housing (is placed loose on stay bolts).

– Unsolder motor connections on the PCB Control.

– Loosen lateral clamping screw of the motor mounting.

– Turn pump motor out of the plastic pinion and press out upward.

– Install new pump motor.
Line up height of cogwheels.
Turn pump motor pinion to the plastic pinion.
Teeth of both cogwheels must interlock perfectly.
In idle status the motor current may not increase 12 mA. Pull off pump tube for measurement.

Mount again ina reverse order.

☞ ***Mount and fasten base plate, see "Mounting the base plate"!***

– Put device into operation.

Replacing heating resistors and temperature sensor ECOM 6125

– Switch off device.

– Disconnect main power plug.

– Remove screws of base plate (4 screws).

☞ ***The incubation control block is glued into the housing.***

– Unsolder heating resistors (Heating resistor 2,7 E ±5 %).

– Unscrew and replace heating resistors.

☞ ***Replacing the temperature sensor is only possible in the factory because of its special mounting. (Resistance PT 100 at 20 °C ca. 100 E)!***

Mount in reverse order.

– Start up device.

– Check incubation, see "Adjusting the incubation".

5 Alignment / Adjustment

Adjusting the base plate

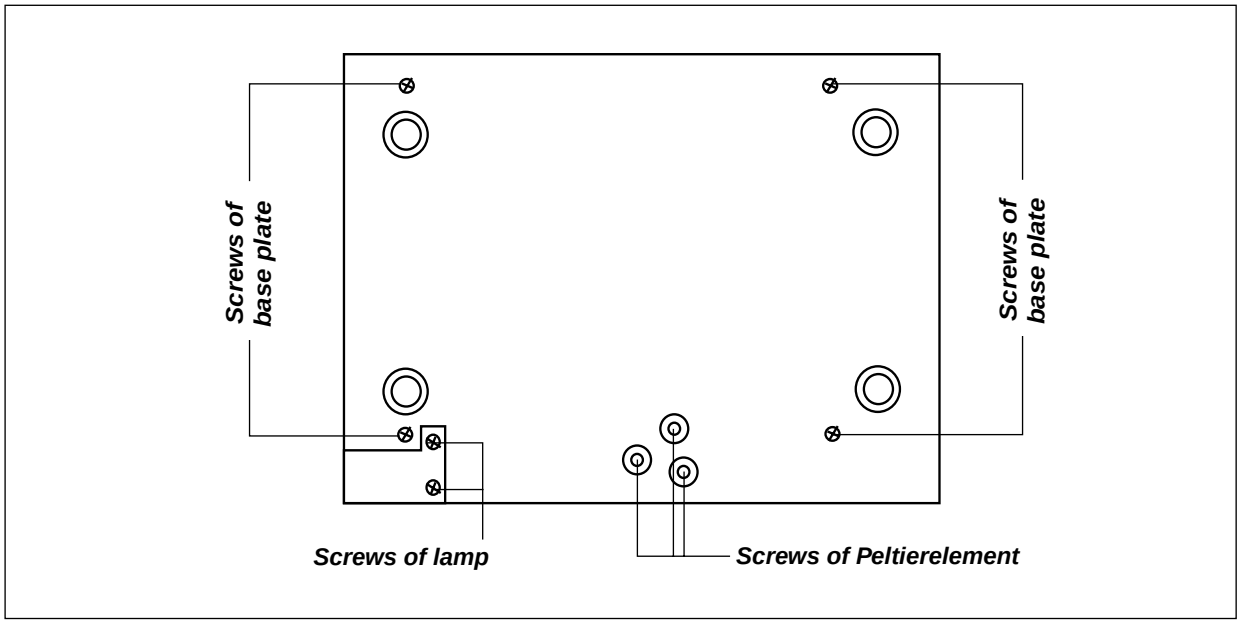
Aid:	Heat-conducting paste (mixture)	6122 044.007
	Torque screwdriver	Bereich 1.8 Nm
	Spatula	

☞ ***Clean all surfaces which come in contact with the Peltier element including the surfaces of the Peltier element itself carefully before mounting!***

The surfaces must be dry and absolutely clean!
The surfaces must not be scratched or uneven!

Scratches, lint or dust particles between the base plate - Peltier element and Peltier element - incubation block lead to poor heat transfer and in turn poor or malfunctioning incubation.

– Apply the diluted heat-conducting paste with a spatula evenly (yet thinly) to both surfaces of the Peltier element. The heat-conducting paste must only bubble slightly.



– Screw in screws of base plate/Peltier element. Do not tighten.

– Place device on side.

– Place both cuvette holders into the measuring and mixing position.

– Center the cuvette holder in the mixing position by shifting the base plate. Turn the cuvette holder by hand. The cuvette holder must not grind.
Tighten screws of the Peltier element slightly one at a time then with a torque screwdriver with 1.8 Nm (only 1/8 of a revolution). Do not tighten on one side, danger of Peltier element breaking.

– Tighten screws of base plate.

– Check smooth operation of the cuvette holder.
Where appropriate, repeat setting.

5 Alignment / Adjustment

Adjusting the incubation

Aids: Temperature measuring device "Yellow Spring"
Cuvette

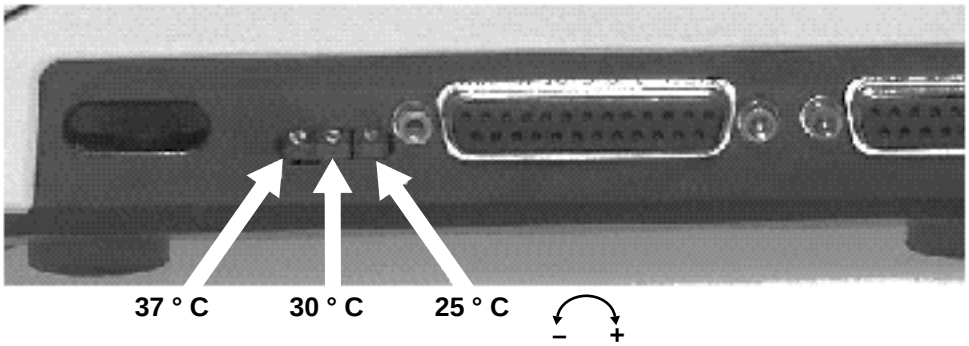
– Fill cuvette with water.

– Switch on device, let warm up for 15 mins.

– Immerse tip of measuring sensor into the water.

– Preselect temperature measuring range 25, 30 and 37 °C one after another under device setting "Temperature". Only 37 °C at 6125-E (potentiometers for 25 und 30 °C are not installed).

– Check temperatures. Adjust temperatures with corresponding potentiometer, where required.



Temperature range: 25.1 °C ±0.1 °C
30.1 °C ±0.1 °C
37.1 °C ±0.1 °C

The temperature to be set lies slightly above the nominal temperature as there is a temperature drop between the adapter and cuvette contents.

Adjusting the mixer motor 6122/6123

– Set toothed wheels on same level.
Teeth of both toothed wheels must interlock a lot.
The tooth clearance should be approx. 0.1 mm.

☞ ***The current consumption of the mixer motor should be max. 20 mA at an operating voltage of 7.5 V!***

ECOM 6122–25

Data sheet 6124 801.000

Description	EDP no.	Dash number								
PCB Control data sheet	6124 801.000	1	2	3						

Pos.	Components and programs										Comment
	PCB Control	6122 800.006	4	5	5						
	EPROM ECOM-F V 2.58	6122 801.042	1	1	2						

Dash no.	Modification notice	Short description of modification	Version no.	Approved on
1	16/180	New languages: Polish, Croatian.	2.42	
2	17/010	Plug cover from 6101.		
3	17/145	French language revised. Combi method for Diacron.	2.58	

Special notes:

Data sheet 6124 801.000

7 Spare parts list

Fig.	Pos.	Designation	New part	Pool part
	1	***Device 6122/6123***	***6122 100.012***	
	1	***Device 6124***	***6124 100.010***	
	1	***Device 6125***	***6125 100 013***	
	1-1	Main power input module	6101 122.008	
	1-2	250 mA fuse time-lag UL	0013 584.028	
	1-3	500 mA fuse time-lag UL	0013 574.480	
	1-4	LCD display, cpl.	6122 100 000	
	1-5	LCD display cover	6122 100.080	
	1-6	Key pad German/English 6122 to 6124	0013 606 862	
	1-6	Key par English 6125	0013 608 741	
	1-8	Fan	6122 608.008	
	1-9	Incubation control block 6122/6123	6122 500.002	
	1-9	Incubation control block 6124	6124 500.000	
	1-10	Temperature sensor	6122 607.001	
	1-11	Temperature monitor	0013 599.882	
	1-12	Incubation block 6125	————————	
	1-13	Sensor PCB 6125	6125 803 006	
	1-14	PT 100 for 6125	0013 585 237	
	1-15	Heating resistor for 6125	0013 605 556	
	1-16	Peltier element 6122 to 6124	6122 500.029	
	1-17	Flange sleeve (Peltier element) 6122 to 6124	6122 100.047	
	1-18	Motor with pinion (for mixer and pump)	6122 530.009	
	1-19	Motor for filter rotor	6101 440 000	
	1-20	Filter rotor with filter (standard) 6122/6123	6122 402 000	
	1-21	Filter rotor with filter (standard) Iran	6122 403 007	
	1-21	Filter rotor with filter (standard) 6124	6124 402.008	
	1-21	Filter rotor with filter (standard) 6125	6122 403 007	
	1-22	Receiver	6101 601.003	

7 Spare parts list

Fig.	Pos.	Designation	New part	Pool part
	1-23	Suction cuvette 6124	4052 101.005	
	1-24	Cover for Suction cuvette	6124 526.009	
	1-25	Knurled screw	6124 045.000	
	2	***PCB Control 6122***	***6122 801.002***	***2223 022.807***
	2-1	EPROM "ECOM" 6122	6122 801.045	
	2	***PCB Control ECOM 6122***	***6122 802.009***	***2223 022.823***
	2-2	EPROM "ECOM-Iran" 6122	6122 802.041	
	2	***PCB Control ECOM 6123***	***6123 801.006***	***2223 023.234***
	2-2	EPROM "ECOM-D" 6123	6123 801.049	
	2	***PCB Control ECOM 6124***	***6124 801.000***	***2223 024.249***
	2-1	EPROM "ECOM-F" 6124	6124 801.042	
	2	***PCB Control ECOM 6125***	***6125 801.003***	***2223 025.016***
	2-1	EPROM "ECOM-E" 6125	6125 801.046	
	2-2	Shunt plug	0013 583.439	
	2-3	5KE potentiometer	0013 062.404	
	2-3	Silicone clamp f. cuvette	6124 100.044	
	3	***Accessories***		
	3-1	Heat-conducting paste (mixture)	6122 071.004	
	3-2	Lamp packaged	6122 041.008	
	3-3	Aspiration tube 6124	6124 044.004	
	3-4	Pump tube 6124	6124 043.008	
	3-5	Cable "null modem"	6122 610.002	
	3-6	Printer cable D-Sub, 25p.	0013 606.234	

7 Spare parts list

Fig.	Pos.	Designation	New part	Pool part
	3-7	Printer cable Centronics, 25p.	0013 596 018	
	3-8	Thermal Printer DPU 414	0013 608.148	
	3-9	Power supply 230 V	0013 608.172	
	3-9	Power supply 115 V	0013 608.164	
	3-10	Printer support ECOM	6124 100.125	
	3-11	Thermal paper (10 rolls)	6547 001.018	
	3-12	Printer cable (DPU 414)	0013 598.800	

7 Spare parts list

7 Spare parts list

Recommended spare parts – First equipment

To: ***Eppendorf – Netheler – Hinz GmbH***	From:
Fax No.: ***040 53801758***	Fax No.:
	Name:
	Tel.:
	Job No.:

Quantity	*Fig.*	*Pos.*	*Designation*	*New part*
1		1-6	Key pad German/English 6122 to 6124	0013 606 862
1		1-6	Key pad English 6125	0013 608 741
1		1-8	Fan	6122 608.008
2		1-15	Heating resistor for 6125	0013 605 556
1		1-16	Peltie relement 6122 to 6124	6122 500.029
1		1-20	Filter rotor with filter (standard) 6122/6123	6122 402 000
1		1-21	Filter rotor with filter (standard) 6124	6124 402.008
1		1-21	Filter rotor with filter (standard) 6125	6122 403 007
1		1-22	Receiver	6101 601.003
1		1-23	Suction cuvette 6124	4052 101.005
1		2	PCB Control ECOM 6122	6122 801.002
1		2	PCB Control ECOM 6123	6123 801.006
1		2	PCB Control ECOM 6124	6124 801.000
1		2	PCB Control ECOM 6125	6125 801.003
1		3-1	Heat-conducting paste (mixture)	6122 071.004
3		3-2	Lamp packaged	6122 041.008

7 Spare parts list

8 Technical data

Technical data

Power supply, switchable:	100 V, 120 V, 220 V, 240 V +15 % to –10 % 50/60 Hz ±5 %, VDE, FTZ, GSE and UL
⚠	***For 230 V main power voltage, change to 220 V!***
Power consumption:	26 VA
Temperature control:	The cuvette holder can be incubated to 25, 30 and 37 °C. Heating and cooling is carried out by a Peltier element.
	Ambient temperature range: 15 bis 35 °C Temperature accuracy: ± 0,2 °C Temperature precision: ± 0,1 °C
	Temperature changeover times (at 25 °C ambient temperature): from 25 to 30 °C < 5 min from 30 to 37 °C < 5 min from 25 to 37 °C < 8 min from 30 to 25 °C < 7 min from 37 to 30 °C < 7 min from 37 to 25 °C <10 min
Light path:	Radiation source: Tungsten halogen lamp (Life: approx. 1000 h) Radiation receiver: Silicon photodiode 5 interference filters: Depending on type of device
Photometric measuring range:	A = –0.1 to 2.2 (340 nm) A = –0.1 to 2.5 (405 bis 578 nm)
	Resolution: A = 0,001
	Imprecision: A = –0.1 to 0.2 < ± 0,002 A A = 0.2 to 2.0 < 1 % A = 2.0 to 2.5 < 2 %
	Inaccuracy: A = –0.1 to 0.2 < ± 0,002 A A = 0.2 to 2.0 < ± 1% A = 2.0 to 2.5 < ± 2%
Photometer drift:	Warm-up time 15 min. The drift is < 1 % for the respective measuring range within 15 min.
Short-term precision:	With kinetic measurements (1 min) < 1 mA
Air humidity:	25 to 75 % (rel)
Interface:	Printer connection: Centronics interface EDP: RS-232-C interface
Weight:	Approx. 4.2 kg
Dimensions:	L = 300 mm, B = 250 mm, H = 120 mm

8 Technical data

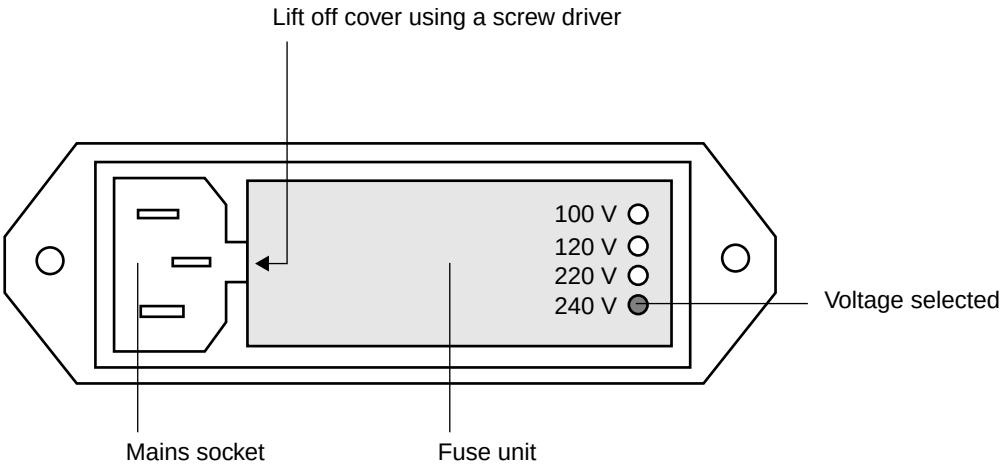
Init values 6125

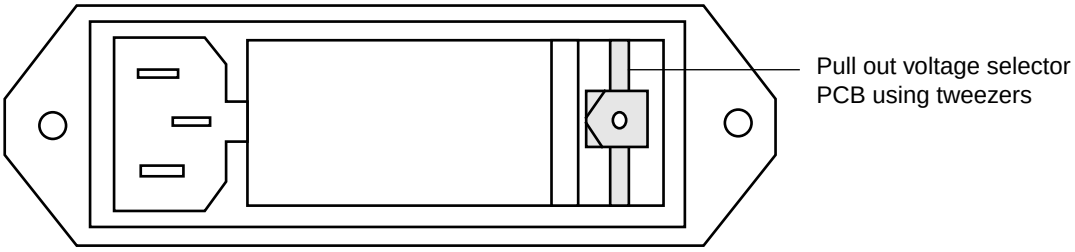
If the function "27 Parameter setzen" is initiated, all existing values are overwritten with the values in the following table:

Printer	endless paper
Result interval	1
Lines per page	68
Date	00:00
Time	00:00
Volumen display	Off
Language	English
Measuring time interval	10 s
Standard filter equipment	
EDP output	Off

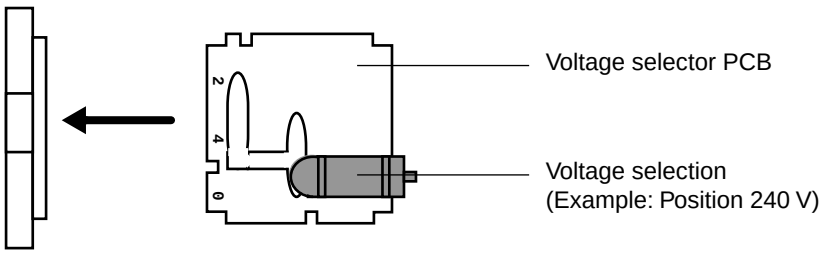
8 Technical data

Power selection





Mounting direction
Nominal voltage printed on PCB must face housing of mains socket!



Mains connector
(side view)

8 Technical data

Transferring methods ECOM 6122/23/24 ➡ ECOM 6122/23/24

Precondition:

The ECOM, from which the data are to be transferred, must be ready for use.
Transferring data ECOM ➡ ECOM is only possible when type and version number of both ECOM are the same.

Procedure:

– Connect both devices with a zero modem cable via the EDP interface.

– Switch on devices.

– Call up "02 Device settings".

– Call up function "19 EDP Output".

– Call up "03 Service function".

– Call up function "14 Transfer method" and start.

– The methods 001 to 100 are transferred.

In case of error:

If data transfer is not possible, make sure that EDP parameters of both devices are the same.

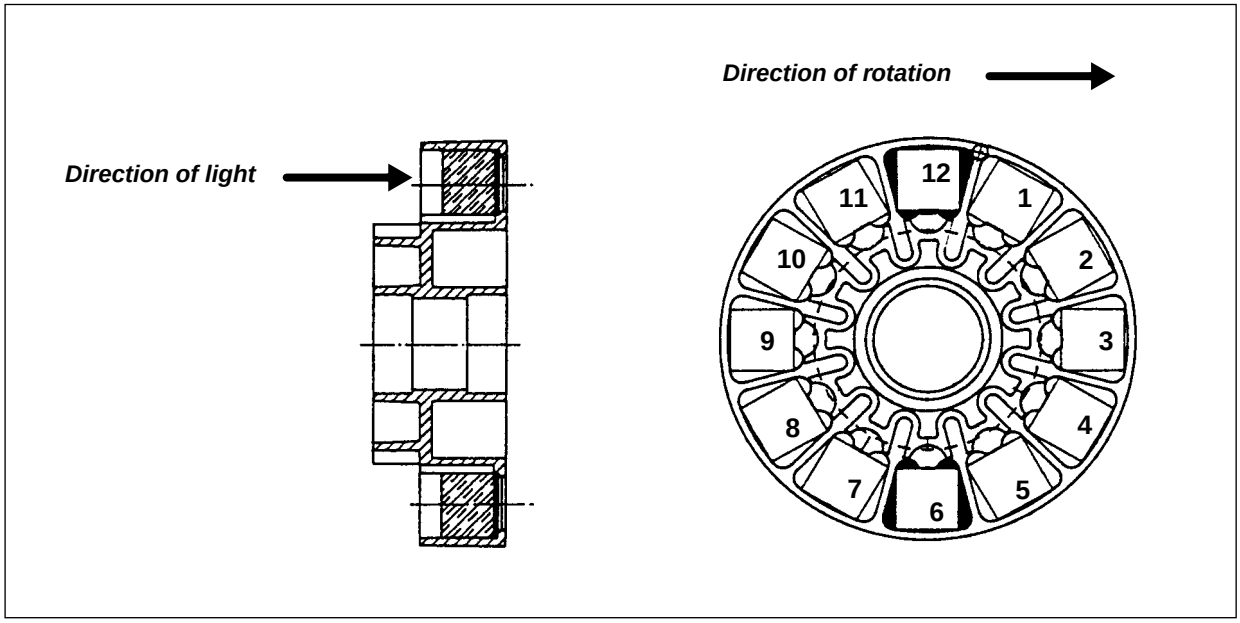
– Call up "02 Device settings".

– Call up function "19 EDP Output".

– Set function "09 to 18" to the same values at both devices.

8 Technical data

Filter equipment



Standard filter equipment

Filter position	ECOM 6122 ECOM 6123	ECOM 6122-Iran ECOM 6125	ECOM 6124
1	340 nm	340 nm	340 nm
2	405 nm	405 nm	405 nm
3			
4	495 nm	495 nm	495 nm
5	546 nm	546 nm	546 nm
6			
7			
8		623 nm	623 nm
9			
10	578 nm	578 nm	578 nm
11			690 nm
12			

☞ ***Some devices have a different filter equipment!***

10 Operation

Summary of user functions and device settings

ECOM 6122 und 6123

01 User functions (up to version 2.43)

01 Cuvette blank
02 Serial no.
03 Zero adjustment
04 Patient results
05 Print methods
06 Print method param.
07 Print calib. report
08 Print QC parameters
09 Print QC functions
10 Print error list
11 Print user functions
12 Print device settings
13 Print serv. functions
14 Method transfer
15 Page feed

02 Device settings(up to version 2.43)

01 Temperature
02 Cuvette
03 Printer
04 Thermo printer
05 Lines per page
06 Result interval
07 Date
08 Time
09 Device number
10 Baud rate
11 Data bits
12 Stop bits
13 Parity
14 Preamble
15 Postamble
16 Control procedure
17 Data block set-up
18 Data block interval
19 EDP output
20 Operator dialog

ECOM 6124

01 User functions

01 Zero adjustment
02 Patient results
03 Print methods
04 Print method param.
05 Print calib. report
06 Print QC parameters
07 Print QC functions
08 Print user functions
09 Print device settings
10 Print serv. functions
11 Serial no.
12 Method transfer
13 Page feed

02 Device settings (from version 2.58 onw)

01 Aspirating time
02 Reaspirating time
03 Rinsing time
04 Temperature
05 Date
06 Time
07 Operator dialog
08 Language

10 Operation

ECOM 6125

01 User functions (from version 1.11 onwards)

01 Display results
02 Print results
03 Print calib. report
04 Print methods
05 Print parameters
06 Print Functions
07 Printer selection
08 Paper size
09 Line space
10 Lines per page
11 Page feed
12 Date
13 Time
14 Measuring range
15 Erase results
16 Volume display
17 Copy method
18 Print error list
19 Time signal
20 Language

Additional functions

Call up via "Switch device off/on". "eppendorf ECOM V ..." appears in the display. Press "Measure" and then ".". Additional functions are loaded.

21 Filter rotor
22 Set filter
23 Meas. time interval
24 Measure
25 Printer test
26 Keypad test
27 Erase calibration
28 Erase parameters
29 Erase error list
30 Set parameters
31 Filter position
32 Method transfer
33 EDP output
34 Send results
35 Converter test
36 Test version

02 Device settings

Select function with the "▲" or "▼" keys or the function number. Confirm with "ENTER". Modify selected functions with "CLEAR" and save desired setting with "ENTER".

Aspirating time	Setting range 0–99 s
Reaspirating time	Setting range 0–99 s
Rinsing time	Setting range 0–99 s
Temperature	Temperature entry 25, 30 or 37 °C.
Cuvette	Entry of cuvette type. Cuvette type: suction cuvette, K/E-Cuvette and rectangle cuvette. From Version 2.3 onwards, mixing is no longer switched off when the suction cuvette is selected.
Printer	Printer on/off.
Thermoprinter	Thermoprinter on/off. No line feed. 80 char./line.

Lines per page	Enter number of lines. 50-68 lines are possible.
Result internal	One or two blank lines between results can be selected. Enter number of blank lines.
Date	Enter date.
Time	Enter time.
Device number	If several ECOM's are connected to the EDP, a device number can be entered for better allocation.
Baud rate	Bring desired baud rate into the display. Baud rates: 300, 600, 1200, 2400, 4800, 9600 and 19200.
Data bits	Bring desired data bit into the display. Data bit: 7 or 8.
Stop bits	Bring desired stop bit into the display. Stop bit: 1 or 2.
Parity	Bring desired parity into the display. Parity: none, even or odd.
Preamble	Control characters for start of data block. Bring desired control character into the display. Control character: STX or CR LF or CR or STX CR LF.
Postamble	Control characters for end of data block. Bring desired control character into the display. Control character: ETX or CR LF or CR or CR LF ETX.
Control procedure	Mode of transmission. Bring desired mode of transmission into the display. Mode of transmission: A or B with ACK or NAK.
Data block set-up	Bring desired data block into the display. Data block: ECOM 6122 or PCP 6121.
Data block interval	Enter time in "msec".
EDV output	EDP output On-line/Off-line.
Operator dialog	Bring desired operator dialog into the display. Version 1.3 and 2.1: German and English. From Version 2.3 upwards: German, English, French, Polish, Russian, Czech and Croatian.

10 Operation

Summary of service functions

ECOM 6122 and 6123

03 Service functions (Version 1.31)

01 Filter rotor
02 Set filter
03 Mixer
04 Set parameters
05 Delete pat. results
06 Delete QC results
07 Mixer start time
08 Mixer stop time
09 Mixing time
10 Meas. time interval
11 Measure
12 Conv. test
13 Printer test
14 Keypad test
15 Temp time
16 Lamp test
17 Transmit meth.

03 Service functions (Version 2.1)

01 Filter rotor
02 Set filter
03 Mixer
04 Set parameters
05 Delete pat. results
06 Delete QC results
07 Meas. time interval
08 Measure
09 Conv. test
10 Printer test
11 Keypad test
12 Temp time
13 Lamp test
14 Transmit meth.

Additional functions for research and development:

Call up via "Switch device off/on". "eppendorf ECOM V ..." appears in the display. Press "Measure" and then ".". Additional functions are loaded.

18 Print converter data
19 Test version

16 Mixer stop time
17 Mixing time
18 Print converter data
19 Test version

03 Service functions (Version 2.3)
01 Filter rotor
02 Set filter
03 Mixer
04 Set parameters
05 Delete pat. results
06 Delete QC results
07 Meas. time interval
08 Measure
09 Conv. test
10 Printer test
11 Keypad test
12 Temp time
13 Lamp test
14 Transmit meth.

03 Service functions (Version 2.43)
01 Filter rotor
02 Set filter
03 Mixer
04 Delete pat. results
05 Delete QC results
06 Meas. time interval
07 Measure
08 Conv. test
09 Printer test
10 Keypad test
11 Temp time
12 Lamp test
13 Transmit meth.

Additional functions for research and development:

Call up via "Switch device off/on". "eppendorf ECOM V ..." appears in the display. Press "Measure" and then ".". Additional functions are loaded.

15 Filter position
16 Mixer start time
17 Mixer stop time
18 Mixing time
19 Print converter data
20 Test version

14 Set parameters
15 Filter position
16 Mixer start time
17 Mixer stop time
18 Mixing time
19 Print converter data
20 Test version

10 Operation

ECOM 6123

03 Service functions (from version 2.32 onw.)

01 Filte rrotor
02 Set filter
03 Mixer
04 Delete pat. results
05 Delete QC results
06 Meas. time interval
07 Measure
08 Conv. test
09 Printer test
10 Keypad test
11 Temp time
12 Lamp test
13 Transmit meth.

Additional functions for research and development:

Call up via "Switch device off/on". "eppendorf ECOM V ..." appears in the display. Press "Measure" and then ".". Additional functions are loaded.

15 Filter position
16 Mixer start time
17 Mixer stop time
18 Mixing time
19 Print converter data
20 Test version

ECOM 6124

03 Service functions (from version 2.39 onw.)

01 Filter rotor
02 Set filter
03 Peristaltic pump
04 Print error lists
05 Delete pat. results
06 Delete QC results
07 Meas. time interval
08 Measure
09 Conv. test
10 Printer test
11 Keypad test
12 Temp time
13 Lamp test
14 Transmit meth.
15 Device number
16 Baud rate
17 Data bits
18 Stop bits
19 Parity
20 Preamble
21 Postamble
22 Control procedure
23 Data block set-up
24 Data block interval
25 EDP output

ECOM 6124

03 Service functions (from version 2.58)

01 Filter rotor
02 Set filter
03 Peristaltic pump
04 Print error lists
05 Delete pat. results
06 Delete QC results
07 Meas. time interval
08 Measure
09 Conv. test
10 Printer test
11 Keypad test
12 Temp time
13 Lamp test
14 Transmit meth.
15 Device number
16 Baud rate
17 Data bits
18 Stop bits
19 Parity
20 Preamble
21 Postamble
22 Control procedure
23 Data block set-up
24 Data block interval
25 EDP output

Additional functions for research and development:

Call via "Switch device off/on". "eppendorf ECOM V ..." appears in the display. Press "Measure" and then ".". Additional functions are loaded.

27 Filter position
28 Print converter data
29 Test version

26 Set parameters
27 Filter position
28 Print converter data
29 Test version

10 Operation

Overview Service functions

ECOM 6125

The service functions are called up via "Switch ECOM Off/On".
"eppendorf ECOM 6125" appears in the display.
Press "ABSORBANCE" and then ".".

21	FILTER ROTOR	
22	SET FILTER	
23	MEAS.TIME INTERVAL	10–999 s
24	MEASURE	
25	PRINTER TEST	
26	KEYPAD TEST	
27	DELETE CALIBRATION	
28	DELETE PARAMETERS	
29	DELETE ERROR LISTS	
30	SET PARAMETERS	
31	FILTER POSITION	
32	TRANSMIT METH.	
33	EDP OUTPUT	0 / 1
34	TRANSMIT RESULTS	
35	CONV. TEST	
36	TEST VERSION	

03 Service functions – Description

Select function with the "▲" or "▼" keys or select the function number. Confirm with "ENTER". Modify selected functions with "CLEAR" and save desired setting with "ENTER".
Or, initiate desired setting with "ENTER", abort with "CLEAR".
Call up via "Switch ECOM Off/On".
"eppendorf ECOM V ..." appears in the display. Press "Measure" and then ".". Additional functions are loaded.

Filter rotor	Filter rotor endurance test.
Set filter	Filter selection. Selected filter is turned into the light path. Standard filter equipment see "Filter equipment".
Mixer	Mixer endurance test.
Set parameters	The ENH-specific values are fed into the program memory (see "Init values"). All data modified is transferred. ⚠ ***Caution when filter equipment differs from standard!***
Delete pat. results	All patient data stored up to now is deleted.

Delete QC results	All QC results stored up to now are deleted.
Mixer start time	Only for research and development.
Mixer stop time	Only for research and development.
Mixing time	Only for research and development.
Meas. time interval	Only for research and development!
Measure	Only for quality control! (Drift measure-ment). A measurement against air without sample and without RB is made. Measuring time interval" entered. Bring desired filter into the display. The selected filter is turned into the light path. Press "ENTER" several times to initiate measurement. Permitted drift in one hour < 2 mA. The results can be called up under "Patient results".
Conv. test	The difference between the switching thresholds is queried and displayed. The difference must not exceed ±2 %. For this test, a resistance combination must be soldered in (see Sec. 3, "Amplifier measuring aid").
Printer test	All possible characters are printed continuously. To abort printer test with ECOM-E 6125 select another function.
Keypad test	Checks that all keys function correctly. To stop keypad test, press "FUNCTION".
Temp time	Only for quality control! When this function is initiated, the device is incubated to 37 °C. After 37 °C have been reached, the device is countercooled down to 25 °C. The cool-down time is measured and displayed. This function has no binding statement. It just checks the heating and cooling phase.
Lamp test	The intensity of the lamp is checked.)
Transmit method	With the aid of this function, the entire methods from 001 to 100 can be transferred from ECOM to ECOM. Data transmission from ECOM => ECOM is only possible with the same ECOM type and same version number. Connect both devices with a zero modem cable via the EDP-interface. The EDP parameters of both devices must be set to the same values before transmission is initiated (see "Init values" and "Data trans-mission"). ECOM-E 6125: No "ready" message.
Device number	If several ECOM's are connected to the EDP, a device number can be entered for better allocation.
Baud rate	Bring desired baud rate into the display. Baud rates: 300, 600, 1200, 2400, 4800, 9600 and 19200.

10 Operation

Data bits	Bring desired data bit into the display. Data bit: 7 or 8.
Stop bits	Bring desired stop bit into the display. Stop bit: 1 or 2.
Parity	Bring desired parity into the display. Parity: none, even or odd.
Preamble	Control characters for start of data block. Bring desired control character into the display. Control character: STX or CR LF or CR or STX CR LF.
Postamble	Control characters for end of data block. Bring desired control character into the display. Control character: ETX or CR LF or CR or CR LF ETX.
Control procedure	Mode of transmission. Bring desired mode of transmission into the display. Mode of transmission: A or B with ACK or NAK.
Data block set-up	Bring desired data block into the display. Data block: ECOM 6122 or PCP 6121.
Data block interval	Enter time in "msec".
EDP output	EDP output On-line/Off-line. ECOM-E 6125: Enter 1 or 0 when Online/Offline is displayed and confirm with ENTER.
Filter position	Bring desired filter position into the display, enter desired filter.
Print converter data	Only for internal use (development).
Test version	Only for internal use (development).

10 Operation

Initialization values 6122/6123/6124

If the function "04 Set parameters" is initiated in "03 Service functions", all existing values are overwritten with the values in the following table:

Cuvette blank On/Off	On	
Zero adjustment filter	0.000 A	
Temperature	25 deg.	
Cuvette	E/K/rect. cuvette	
Printer	Off	
Thermoprinter	Off	
Lines per page	68	
Result interval	1	
Device number	1	
Operator dialog	English	
Mixer start time E/K/rect. cuvette	500 msec	(6122-I/6123-D)
Mixer stop time E/K/rect. cuvette	150 msec	(6122-I/6123-D)
Mixing time E/K/rect. cuvette	6 msec	(6122-I/6123-D)
Aspirating time	3 sec	(6124-F)
Reaspirating time	1 sec	(6124-F)
Rinsing time	7 sec	(6124-F)
Meas. time interval	10 sec	
Data block interval	100 msec	
Standard filter equipment	See Sec. 4 "Filter equipment"	

A data transmission from ECOM ➡ ECOM is only possible with the same ECOM type and same version number. For data transmission, the following init values have to be set on both devices:

Baud rate	9600
Data bits	7
Stop bits	1
Parity	even
Preamble	<STX>
Postamble	<ETX>
Control procedure	A
Data block set-up	ECOM 6122
EDP output	On-line

Flow-through cuvette ECOM 6124

Recommended solutions

To maximize the life of the flow-through cuvette, the cuvette and tube system should be rinsed and cleaned regularly.
Eppendorf recommends the following solutions for this purpose:

ECOM system blank solution
Dilute concentrate 1:100 with distilled water.

ECOM cleaner
Dilute concentrate 1:5 with distilled water.

Rinsing procedure

The [·] key is used for rinsing and cleaning the cuvette:

- Hold aspirating tube in the system blank solution or cleaner.
- Press [·].
- When the aspirating procedure is complete (beep sounds), remove system blank solution or cleaner. You can define how long the solution is aspirated with the "Rinsing time" function.

Maintaining the cuvette

The following maintenance is recommended:

1 When method complete:
  - Rinse cuvette once with system blank solution.

2 When method is changed and the method combination is extremely sensitive to carryover (example: measurement of lipase after triglycerides):
  - Rinse cuvette once with cleaner then rinse once with system blank solution.

3 At the end of the working day:
  - Rinse cuvette once with cleaner then rinse once with system blank solution.

☞ ***Do not clean cuvettes with cleaning solution with a temperature > 40 °C! Cuvettes may be destroyed!***